

REMARKS

Prior to entry of this amendment, claims 1-28 are currently pending in the subject application. By the instant amendment, claim 19 is amended to correct a minor grammatical error and claims 29 and 30 are added.

Applicants appreciate the Examiner's acknowledgement of applicants' claim for foreign priority and receipt of a certified copy of the priority document.

Applicants further appreciate the Examiner's consideration of applicant's Information Disclosure Statement (IDS) filed August 10, 2005.

Applicants request, in the next Office action, that the Examiner indicate whether the IDS filed September 25, 2003, has been considered. Additionally, applicants note that a third IDS was filed September 26, 2005, after the mailing of the outstanding Office action.

Applicants also request, in the next Office action, that the Examiner indicate the acceptability of the drawings filed on September 25, 2003.

Claims 1-30 are presented to the Examiner for further or initial prosecution on the merits.

A. Introduction

In the outstanding Office action, mailed September 15, 2005, the Examiner rejected claims 1-3 and 9-28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,911,507 to Polla et al. ("the Polla et al. reference") in view of U.S. Patent No. 6,677,709 to Ma et al. ("the Ma et al. reference") and further in view of U.S. Patent No. 6,670,212 to McNie et al. ("the McNie et al. reference"), rejected claim 8 under 35 U.S.C. § 103(a) as being unpatentable over the Polla et al. reference in view of the Ma et al. and McNie et al. references and further in view of U.S. Patent No. 6,245,444 to Marcus et al. ("the Marcus et al. reference"), and objected

to claims 4-7, while indicating that claims 4-7 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims.

B. Asserted Obviousness Rejection of Claims 1-3 and 9-28

In the outstanding Office action, the Examiner rejected claims 1-3 and 9-28 under 35 U.S.C. § 103(a) as being unpatentable over the Polla et al. reference in view of the Ma et al. reference and further in view of the McNie et al. reference. Applicants respectfully traverse this rejection, and submit that the Examiner failed to set forth a *prima facie* case of obviousness under 35 U.S.C. § 103(a) for at least the reasons set forth below.

Claim 1 recites, in part, forming a sacrificial layer on a flexible substrate. In the outstanding Office action, the Examiner admitted that the Polla et al. reference fails to disclose forming a flexible substrate, but asserted that the Ma et al. reference discloses forming a flexible substrate, and stated that one skilled in the art at the time the invention was made would have found it obvious to modify the method of Polla et al. in view of the Ma et al. reference because the Ma et al. reference discloses that MEMS devices can be fabricated on flexible substrates.

*Office action of September 15, 2005, at section 2, page 3.* Applicants respectfully disagree.

In particular, applicants respectfully submit that it would not be obvious under 35 U.S.C. § 103(a) to combine the Polla et al. and Ma et al. references because there is no motivation to combine the references and, even if combined, the resulting combination would be unworkable.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. . . . *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

MPEP 706.02(j).

MPEP 706.02(j) requires that there be a motivation to combine the Polla et al. and Ma et al. references. Applicants note that the Polla et al. reference requires that the PZT structure be cured at a temperature greater than 550 °C, and preferably about 650 °C for twenty minutes. *The Polla et al. reference, col. 11, lines 66-67.* However, the Ma et al. reference discloses that high temperature fabrication processes generally prevent any organic substrates from being used because the organic substrates break down at high temperatures. Thus, the Ma et al. reference teaches away from using flexible substrates in processes such as those used in the Polla et al. reference.

Further, if, as the Examiner asserted, the silicon wafer 12 of the Polla et al. reference were to be replaced with a polyester or polyimide substrate of the Ma et al. reference, the curing of the PZT structure would destroy the organic substrate. In this regard, it is notable that the MEMS device disclosed in the Ma et al. reference is not a PZT-based device. Rather, it acts through electrostatic effect. *The Ma et al. reference, col. 5, lines 31-34.* Thus, it is apparent that the high temperatures employed in the method of the Polla et al. reference preclude replacing the rigid substrate of the PZT MEMS device therein with the flexible substrate of the Ma et al. reference. Accordingly, not only is there no motivation to combine the references, there would be no reasonable expectation of success even if they were combined.

In this regard, it is also notable that the Examiner's rejection of claims 18-20 failed to state how the claim elements of "depositing a piezopolymer" (claim 18) or selecting the piezopolymer "from the group consisting of PVDF, PVDF-TrEF, TrEF, Polyurea, polyimide and Nylon" (claim 20) are disclosed or suggested by the proposed combination of references. *See the Office action of September 15, 2005, at section 2, page 4.* The Polla et al. reference discloses a ceramic PZT piezoelectric that is cured at greater than 550 °C, and preferably about 650 °C for

twenty minutes, as noted above. In contrast, claims 18-20 recite an active layer formed by depositing a piezopolymer. Piezopolymers are compatible with flexible substrates and the attendant low temperature fabrication processes, as described in the specification. *See, e.g., paragraph [0036] of the specification.*

For at least the reasons set forth above, applicants respectfully submit that the Examiner failed to set forth a *prima facie* case of obviousness with respect to claims 1-3 and 9-28. Accordingly, applicants respectfully request that this rejection be reconsidered and withdrawn.

C. Asserted Obviousness Rejection of Claim 8

In the outstanding Office action, the Examiner rejected claim 8 under 35 U.S.C. § 103(a) as being unpatentable over the Polla et al. reference in view of the Ma et al. reference and the McNie et al. reference and further in view of the Marcus et al. reference.

Claim 8 depends from claim 1, and is therefore believed to be allowable for at least the reasons set forth above. Accordingly, applicants respectfully request that this rejection be reconsidered and withdrawn.

D. Allowable Subject Matter

In the outstanding Office action, the Examiner objected to claims 4-7, while indicating that claims 4-7 would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Applicants appreciate the indication of allowable subject matter in claims 4-7. However, as set forth above, applicants respectfully submit that all of the pending claims are allowable.

E. New Claims

By the instant amendment, claims 29 and 30 are added. No new matter is added, and support for claims 29 and 30 can be found in the specification as originally filed at, e.g.,

paragraphs [0029], [0031] and [0036]. Claims 29 and 30 depend from claim 1, and applicants respectfully submit that claims 29 and 30 are allowable for at least the reasons set forth above.

F. Conclusion

Since the cited prior art relied on to reject the claims of the subject application fails to anticipate or render obvious the present invention, applicants respectfully submit that claims 1-30 are in condition for allowance, and a notice to that effect is respectfully requested.

If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing amendments and remarks, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

Respectfully submitted,

LEE & MORSE, P.C.

Date: December 14, 2005

  
Eugene M. Lee, Reg. No. 32,039

**LEE & MORSE, P.C.**  
1101 WILSON BOULEVARD, SUITE 2000  
ARLINGTON, VA 22209  
703.525.0978 TEL  
703.525.4265 FAX